



SVX4 power

- Designers predicted
 - ◆ 2 chipper 0.34 A
 - ◆ 6 chipper 0.70 A
 - ◆ 10 chipper 1.06 A
- Measure
 - ◆ 10 chipper 0.8-0.9 A
 - ▲ ~30 Hz readout does not change visibly the current
 - ▲ Can be up to 1.1-1.2 A before download
 - Observed range 0.5-1.2 A
 - ▲ Currents are stable before and after download
 - ◆ 4 chipper 0.3-0.4 A
- AC power : contribution from chip voltages (VDD)
 - ◆ 243 W per side
 - ▲ Used designers currents
 - ▲ Assumed VDD=2.5 V and 0.6 V drop on regulators
 - Testing 0.6 V assumption
 - According to specs 0.3V should be enough for 1A current



AC power

- Used for estimates
 - ♦ 5V : 0.18A per ch
 - ♦ 3.3V : 0.12A per ch
- Recent measurements
 - ♦ 5V
 - ▲ idle current 0.02A per ch
 - ▲ Instantaneous peak current during readout 0.165A per ch
 - ♦ 3.3V : 0.11A per ch
- AC power : contribution from AC itself
 - ♦ Assume two voltage regulators
 - ♦ 5V : 0.47W per ch, assumes
 - ▲ 5.5V before voltage regulator
 - ▲ 10kHz readout in read-all mode (may be too conservative)
 - Scales with rate
 - Sparse mode will decrease the number by factor of 3-4
 - ♦ 3.3V : 0.43W per ch, assumes
 - ▲ 3.8V before voltage regulator
 - ♦ Total power = $(0.47+0.43) \times 444 = 400$ W per side



AC power

- Grand total of AC power (preliminary)
 - ♦ $243 + 400 = 643$ W per side
- Plans
 - ♦ KSU and Fermilab are doing more measurements with AC prototype
 - ♦ Will discuss the results at the electronics meeting and write up the official estimate of the power
 - ♦ Things that can influence the result
 - ▲ Voltage headroom for the SVX4 regulators
 - ▲ Choice for the 5V and 3.3V voltage regulators
 - 6 options are being discussed
 - ▲ Contribution from terminations on AC
 - ▲ Assumptions about the readout rate and readout mode